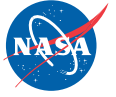# Human Factors

research and technology division

Human-Automation Integration Research Branch (THI)

Research in the Human-Automation Integration Research Branch focuses on designing complex and safety-critical aerospace automation to optimize performance of the system comprising both the automation and its human operators. This automation will capitalize on the inherent capabilities of its operators (such as astronauts, pilots, and air traffic controllers), while minimizing or eliminating the adverse consequences of human error or other human limitations.

Our scientists study human cognitive architecture as it relates to the use of automation, including multitasking performance and decision making under uncertainty. Other scientists and engineers investigate the design of automation, including its associated interfaces, procedures, and operator training, to eliminate error-prone features of the automation and to ensure the optimum allocation of tasks between the operator and the automation.

We have developed methodologies for the design of robust aviation automation and user interfaces that fully support the operator's tasks in managing the automation. We conduct simulations for the design and evaluation of new concepts in air traffic management in which flight crews contribute to ensuring more efficient traffic flow while maintaining safe aircraft separation.

Areas of research include:

- Co-operative Separation between Flight Crews and Air Traffic Control
- Distributed Airspace Systems Modeling and Simulation
- Cognitive Engineering Methods for Aerospace Systems Design
- Human-Automation Interaction and Interfaces
- Aerospace Human Factors Design Methodology
- Redesign of Space Shuttle Information Displays
- Human Performance Modeling for Complex Environments
- Human Cognition
- Color Usage Research
- Development of New Interfaces for Next-Generation Spacecraft

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